

NAME:

DATE:

Unit-2 Mastery Assessment (version 640)

Question 1 (10 points)

Let f represent a function. If $f[4] = 13$, then there exists a knowable solution to the equation below.

$$y = 2 \cdot f\left[\frac{x}{3} - 12\right] + 18$$

Find the solution.

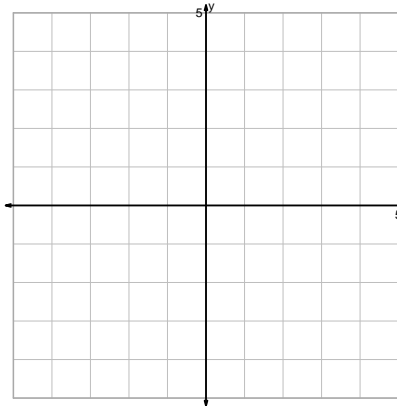
$$x =$$

$$y =$$

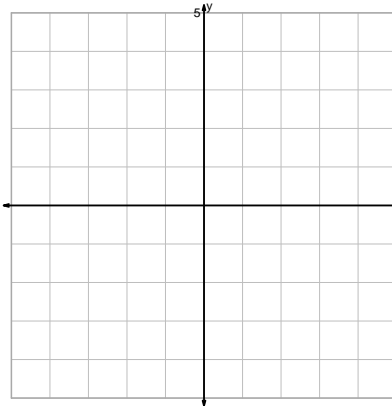
Question 2 (20 points)

Graph the equations accurately. For each integer-integer point on the parent, indicate the corresponding point precisely. Also, with dashed lines, indicate any asymptotes.

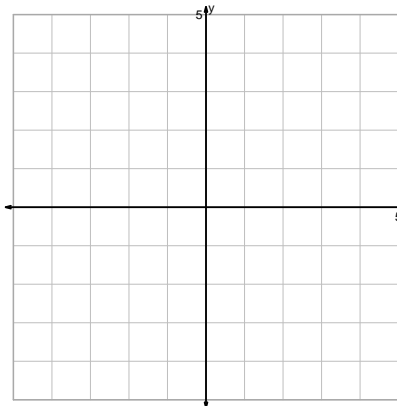
$$y = -\sqrt{x}$$



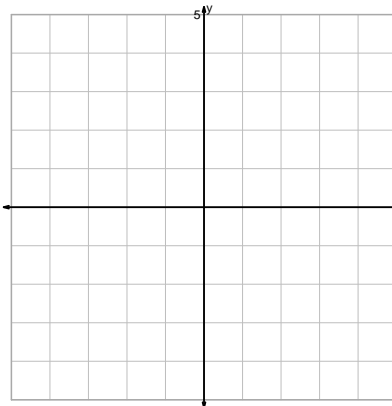
$$y = \sqrt{2x}$$



$$y = x^2 + 2$$

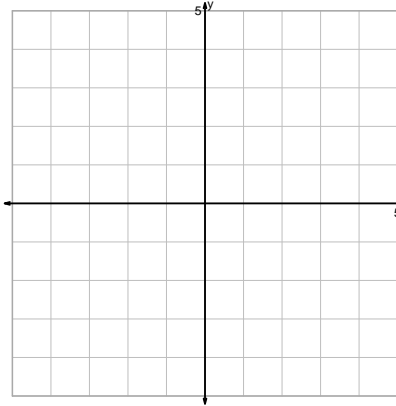


$$y = \frac{x^3}{2}$$

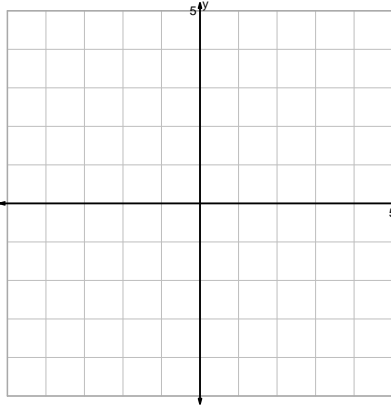


Question 2 continued...

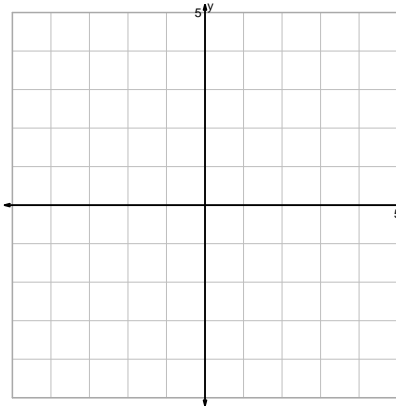
$$y = 2^{-x}$$



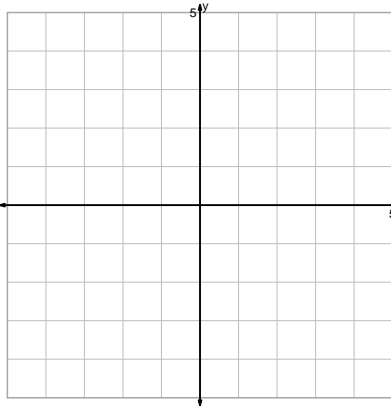
$$y = 2 \cdot \log_2(x)$$



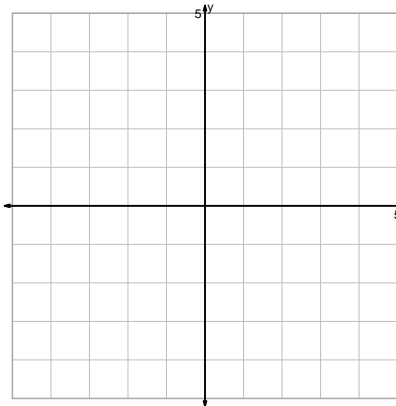
$$y = 2^{x-2}$$



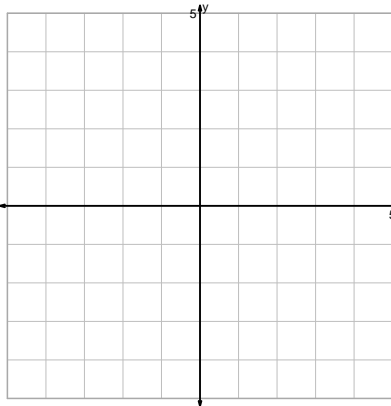
$$y = \sqrt[3]{\frac{x}{2}}$$



$$y = \sqrt[3]{x+2}$$

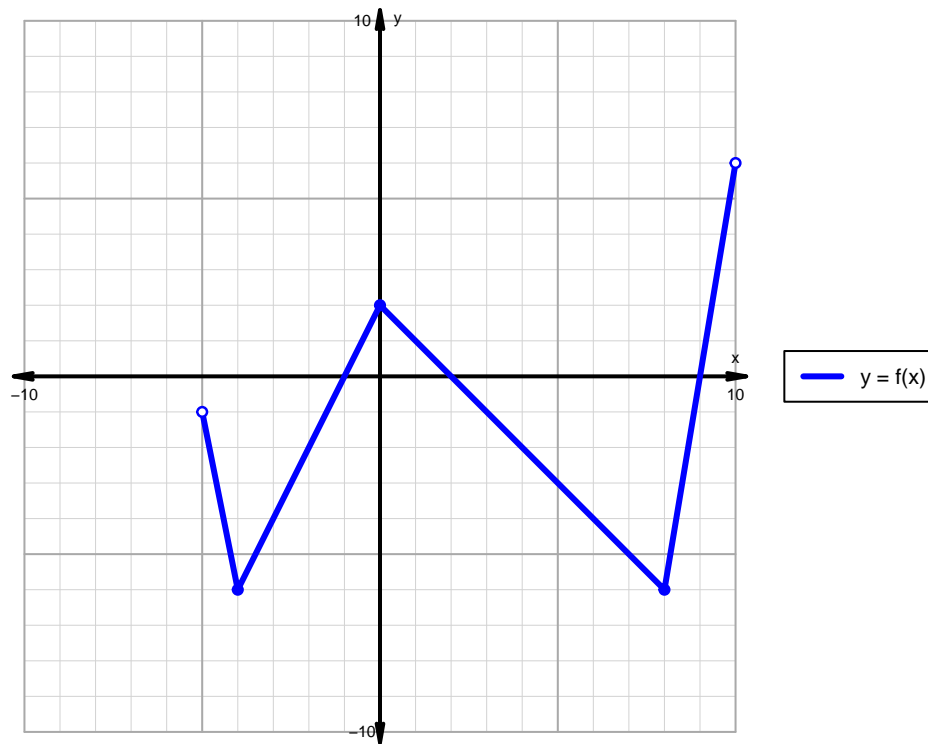


$$y = x^3 - 2$$



Question 3 (20 points)

A function is graphed below.



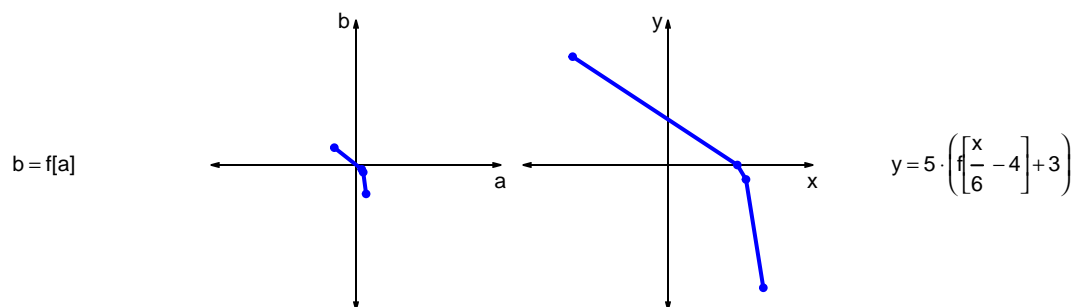
Indicate the following intervals using interval notation.

Feature	Where
Positive	
Negative	
Increasing	
Decreasing	
Domain	
Range	

Question 4 (20 points)

Let f represent a function. The curves $b = f[a]$ and $y = 5 \cdot \left(f\left[\frac{x}{6} - 4\right] + 3\right)$ are represented below in a table and on graphs.

a	b	x	y
-15	12	-66	75
4	-3	48	0
5	-5	54	-10
7	-20	66	-85



- a. Write formulas for calculating x from a and calculating y from b . (Or, write the coordinate transformation formula.)

- b. What geometric transformations (using words like translation, stretch, and shrink), and in what order, would transform the first curve $y = f[x]$ into the second curve $y = 5 \cdot \left(f\left[\frac{x}{6} - 4\right] + 3\right)$?

Question 5 (10 points)

A parent square-root function is transformed in the following ways:

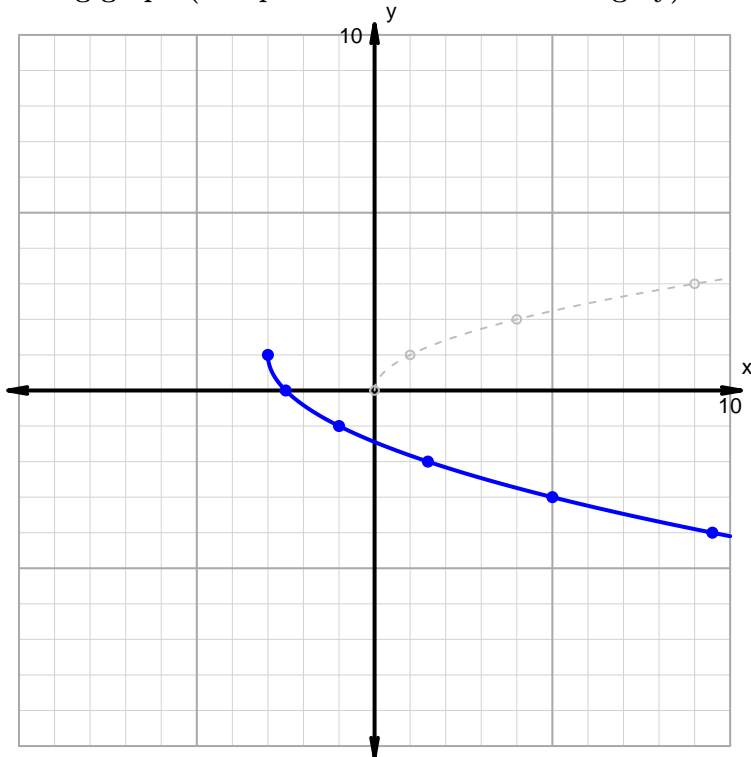
Horizontal transformations

1. Horizontal shrink by factor 2.
2. Translate left by distance 3.

Vertical transformations

1. Vertical reflection over x axis.
2. Translate up by distance 1.

Resulting graph (and parent function in dashed grey):

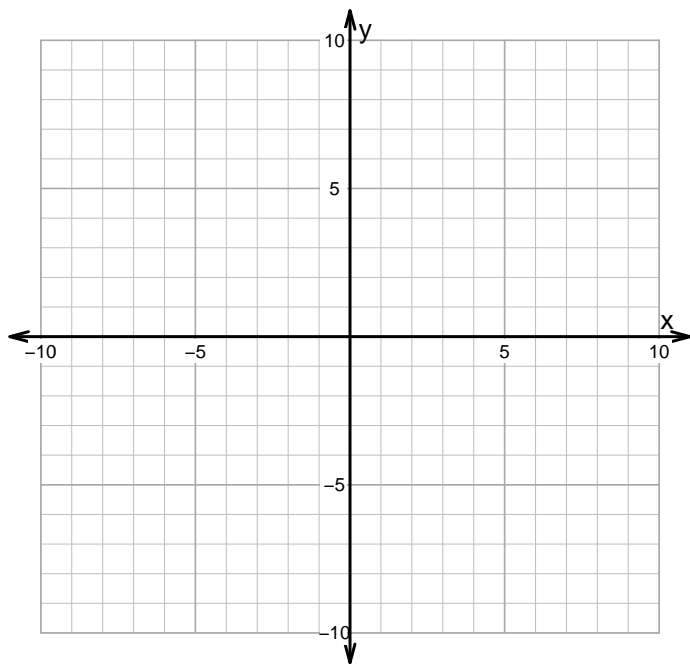


- What is the equation for the curve shown above?

Question 6 (20 points)

Make an accurate graph, and describe locations of features.

$$y = \frac{-1}{3} \cdot |x - 4| + 1$$



Feature	Where
Domain	
Range	
Positive	
Negative	
Increasing	
Decreasing	